

## HIGH-TECH MARKETING - AS A MEANS OF INCREASING THE EFFICIENCY OF MARKETING ACTIVITIES

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**Abstract:** This article describes the role and place of high-tech marketing in assessing the effectiveness of marketing activities in the enterprise. In addition, the article analyzes the possibility of increasing the efficiency of enterprise marketing services through high-tech marketing.

**Key words:** marketing activities, marketing efficiency, marketing services, high-tech marketing.

### Introduction

New technologies come in myriad forms and from a range of contexts. Naturally, when most people think of technology, they think of product categories such as consumer electronics (games, phones, TVs, etc.), information technology (hardware, software, cloud computing), industrial equipment (robotics); medicine/bio-tech (genomics); artificial intelligence (cuts across industries); photonics/lasers; automotive (self-driving cars); and telecommunications (5G networks).

There is also a high-tech economy that is not among them and does not fit into the minds of mankind. Its structural divisions vary, for example, high-tech economy, high-tech management, high-tech marketing, high-tech business, financial activities, high-tech services and so on.

Many businesses view high-tech marketing as a means to increase the efficiency of an enterprise marketing service. Because high-tech marketing differs from other marketing fields in that it is a new and comprehensive field. Therefore, this marketing area serves to increase the efficiency of the enterprise marketing service [2].

Break-through, or radical innovations, are considered “new-to-the-world” products that change the ways people do things and make old ways of doing things obsolete. For example, personal computers changed the way people “typed” documents - it was now word-processing and made typewriters obsolete. Mobile phones changed the ways people communicate, search for information, take pictures, tell time, listen to music, and made a whole host of products obsolete. These breakthrough innovations offer even greater promises and more challenges, when

they are adopted by large business enterprises, governments/municipalities, and organizations, given the sizeable investments that must be made and the corresponding write-offs for obsolete legacy technologies[1].

Companies large and small, both tech companies and traditional companies, face challenges in developing and commercializing break-through innovations. In particular, companies developing and commercializing breakthrough (radical) innovations face more risk than other companies. This risk comes from many sources, including from product development, uncertainties in the market/ customer needs, and business networks and partners that will be required to provide key elements of the solution (think: hardware and software; apps and phones; payment technologies and user interfaces; and so on). For example, technology companies experience difficulties in knowing the best use cases for new technologies, crafting compelling value propositions tailored appropriately for specific market segments, and a lack of a customer/market orientation.

Not only do high-tech companies face greater risks, but they also face additional obstacles, including (for example), a technology (product)-centric orientation with a corresponding tendency to under-value/under-appreciate the necessary marketing capabilities for success. Tech companies tend to be most comfortable developing and investing in their technological strengths, but they tend to under-invest in their marketing strategies. As a result, high-tech companies experience high failure rates.

Studies show that success in high-tech markets requires strengths in both product/technology development and in marketing competencies. Without both of these capabilities working in tandem, high-tech companies are not likely to succeed. Hence, high-tech companies must be especially attentive to developing their marketing competencies. In addition, they must recognize that traditional marketing strategies and frameworks may not work well in the high-tech context.

Turbulent environments – those characterized by risky investments in R&D, emergence of new forms of competition and disruptive business models, and importantly, those where it is difficult to accurately gauge customer needs for adopting new technologies require a strategic marketing process designed explicitly to account for those risk factors.

For example, market research in these environments leverages tools that acknowledge the fact that customers cannot accurately provide input for radical innovations with which they are unfamiliar. So, techniques such as customer visits, ethnographic design/observation, and customer scenario planning are relied upon. Best practices in high-technology marketing also include a unique approach to market segmentation (called “crossing the chasm”), crafting compelling value propositions that are much more quantitative in nature (emphasizing cost savings, revenue growth, etc.) and a marketing communications strategy focused more on thought leadership (content marketing and earned media) than paid media strategies[3].

In addition, companies increasingly are relying on a new form of business strategy, called “platform competition;” platforms provide a place where two groups

–say providers and users – can offer and find solutions to their mutual needs. Two classic examples of platform companies are Airbnb and Uber. Given the transformative power of platforms in the marketplace, many companies (Nike, GE, and others) are transitioning their business models to leverage the power of platform thinking. Because they rely on technology to connect providers with users, platforms are a uniquely high-tech topic that is relevant for all types of companies.

Finally, technology companies as well as a wide range of more traditional companies increasingly are moving to a service-model of delivery think cloud computing, software as a service, open source artificial intelligence tools, etc. “Servitizing” products is an important way to offer new value to customers.

### **Organizing for High-Tech Marketing**

For many established companies, becoming more effective marketers is a matter of fine tuning – increasing expenditures on promotion and advertising or reorganizing the sales force. For high-technology companies, becoming effective marketers is often a matter of starting from scratch. Such companies typically derive their initial strength from the innovations provided by the research and development function. In the midst of a chaotic and fast-changing competitive environment, the importance of research and development cannot be overestimated. As the competitive environment becomes more orderly, the marketing function becomes important for high-technology companies.

The authors contend that high-technology companies can make a successful transition from being innovation-driven to being market-driven only by effectively linking the R&D and marketing efforts. Such linkages can take any number of forms, from special committees to close contact by key officials at all levels of product development, testing, research, and selling. Regardless of what specific form the linkages take, high-technology companies must be on guard to prevent animosity from creeping into marketing-R&D relationship.

High-technology companies often have research and development capabilities superior to those of competitors, yet achieve only mediocre commercial success or fail completely. Are such companies simply in need of improved marketing skills? Not necessarily. Rather, they need to link R&D with marketing[4].

R&D or marketing prowess taken singularly, or even coexisting in the same organization, will not necessarily translate into financial success. Companies that appropriately link the two areas, though, can effectively anticipate, analyze, and exploit market opportunities. This article suggests how managers can forge such a linkage.

### **Distinguishing Between High-Tech Companies**

“High tech” has become a buzzword to describe everything from the space shuttle to the electric frying pan. In our judgment, businesses must meet three criteria to be labeled “high technology”:

1. The business requires a strong scientific-technical basis.
2. New technology can quickly make existing technology obsolete.

3. As new technologies come on stream, their applications create or revolutionize markets and demand.

For the purpose of discussing marketing-R&D linkage, the most important distinction is between what we have called market-driven and innovation-driven high technology. Market-driven high-technology companies assign R&D the task of producing innovations that meet specific market objectives. By contrast, for innovation-driven high-technology companies, what customers need or want is residual. After the R&D breakthrough is made, customer needs or wants are considered. G.D. Searle's low-calorie sweetener, Aspartame, was discovered accidentally by a lab researcher who was involved with a quite different research project. Only then was the commercial application made. We can differentiate further between market-driven and innovation-driven companies[5].

### **Market-driven companies**

These companies fall into one of two groups:

**1. *The state-of-the-art-plus group.*** R&D advances move deliberately as competitors turn modifications and improvements in existing technology into incremental advantage. In the area of robotics, for instance, new steps often occur from customer suggestions. As DeVilbiss Company robotics division marketing executive Timothy Bublick explains, "You develop a robot spray-gun attachment to paint for a specific customer and then it [the modification] becomes a product adaptation to the current state of the art."

If followed exclusively, such a deliberate approach could result in delays in technological breakthroughs. In the semiconductor field, the industry's ability to find ways to cram more transistors into a single chip may forestall advances in optics.

**2. *The problem-solving group.*** These companies do not restrict themselves to current state-of-the-art techniques. As the first high-tech marketer, Thomas Edison, observed, "First, be sure a thing is wanted or needed, then go ahead."

Seconding his view, Edward W. Ungar, head of Battelle Memorial Institute (one of the world's foremost contract R&D organizations) remarked, "In corporate R&D, most ideas for new products need to be evaluated against the test of whether or not the product will be accepted in the competitive marketplace." In applying this problem-solving orientation, Schering-Plough is coupling its discovery abilities with its marketing strengths. Schering-Plough delicately balances a heavy R&D effort with a practical view of how it will position each scientific breakthrough to meet the company's specific long-run objectives.

### **Linkage Roles for Marketing and R&D**

Managers of high-technology companies like to think of themselves as being market-driven. Three-fourths of the executives we surveyed indicate that their new product ideas typically result from specific responses to market opportunities, rather than from R&D initiatives.

### ***Research Methodology***

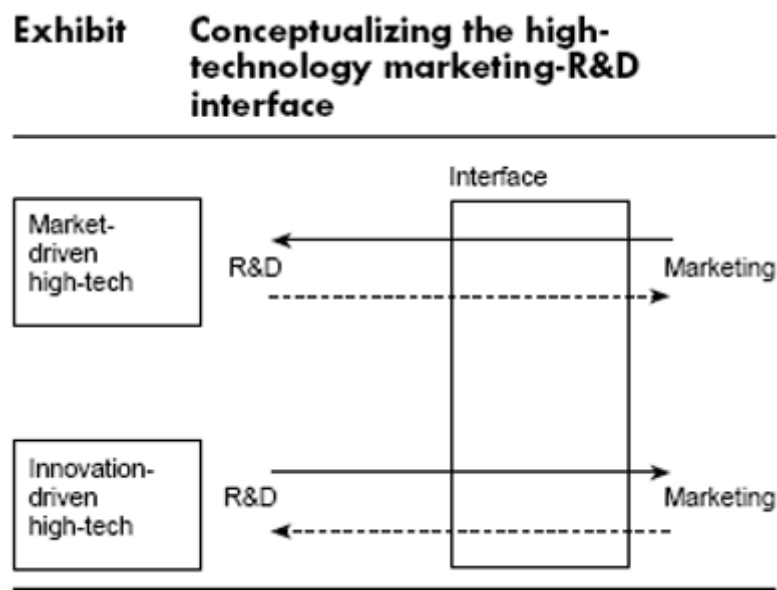
We collected the data for this article via in-person and telephone interviews, questionnaires, and studies of ... In its 1982 annual report, German-based Nixdorf

Computer stated candidly, “Nixdorf maintains two technology centers which monitor...trends in fundamental research and user-oriented technology and assess their potential benefits for Nixdorf’s own R&D efforts.” Thus the company uses the marketplace and competitor developments to provide its window on technology.

Another example of market specificity is Genetic Systems Corp.’s approach in writing lucid market goals guiding its R&D efforts over the short, intermediate and long-term. Its short-term goals identify the need for products to diagnose infectious diseases and cancer. Intermediate goals focus on automated products to identify blood types, and its long-term goals pertain to products for treating infectious diseases and cancer.

### Analysis and results

As shown in the Exhibit, in market-driven high technology, the main direction for R&D is from marketing. R&D’s reaction (dotted arrow) comes in the form of guidance on what is technically feasible and ideas from scientific circles. Formal marketing research, typical to consumer and industrial markets, is helping high-tech managers guide R&D. For example, our data show that executives extensively use traditional research techniques, such as concept testing, product prototypes, and market tests. Over 90% of the executives in our study find that concept testing is helpful in forecasting the success of potential new products.



Picture 1. Exhibit Conceptualizing the high-technology marketing-R&D interface

Innovation-driven high technology offers a marked contrast, as R&D provides the stimulus and marketing officials must find applications or simply sell the product. These efforts can help create new markets by applying lab breakthroughs to largely unperceived buyer needs. A latent demand for in-home pregnancy tests may have existed for centuries, but biotechnology made these tests feasible and inexpensive. Researchers have also been successful in deriving other low-cost diagnostic tests for hepatitis, prostate cancer, and venereal disease. Yet only a few years ago the commercial potential of the underlying technology appeared poor. Certainly, few



businesses would have bet that such diagnostic tests would lead to a major new medical market so soon.

Our research indicates that innovation-driven high-technology companies rely on qualitative marketing research techniques. Their managers place little stock in the mathematically based methods of marketing research that more mature companies use methods requiring an abundance of data from a representative sampling for drawing statistical inferences.

We hear repeatedly that the lack of integration of marketing and R&D is a major obstacle to market success in high technology, and where an interface does exist, it is an inherently adversarial situation in which lab jockeys and pitchmen do not mix.

When we asked executives in a broad spectrum of high-technology companies for their opinions, more than three-fourths think that most companies make some effort to link marketing and R&D. Moreover, they see product planning as both an R&D and a marketing function. Also we find that high-technology marketing people have a predominately scientific background. Ostensibly, then, marketing and R&D managers have little reason to fail to communicate effectively with one another. Even so, we find that power plays or strained relations do frequently occur and that marketing-R&D linkage suffers in the process.

A widely publicized example is the friction at the newly deregulated American Telephone & Telegraph Company. Intense infighting for control between AT&T's marketing people and its technically oriented Western Electric group has become so bitter that the company has already lost key members of its cadre of marketing executives. Turning a longtime technology-driven regulated monopoly into a market-driven competitor is a formidable chore.

Fortunately, lack of sufficient interface in most companies usually results from more benign organizational factors like geographical separation and the difficulty of melding high-tech subsidiaries with a company's traditional product offerings. But geography and product line differences are not insurmountable obstacles if a company works at linkage. TRW Inc., a diverse and geographically dispersed manufacturer headquartered in Cleveland, infused marketing concepts into its West Coast high-technology group while instilling a high-technology orientation in its traditional smokestack operations in the Midwest.

TRW's situation is not unusual. Often a company's headquarters, by design or through acquisition, is located some distance from its high-tech unit or subsidiary. For strategic reasons, the company may have placed the high-tech group in a research environment (Silicon Valley, Route 128, or Research Triangle), or an attractive site (Aspen or Austin, for example), or at some distance from headquarters' distractions. With such real or perceived obstacles, roughly half the executives we surveyed see R&D as having limited meaningful involvement in marketing planning.

### **Conclusion**

What can happen if a company limits R&D participation principally to the research arena? Mark Frantz, president of the rapidly growing Frantz Medical

Development Ltd., comments, “Our business is built on the fact that so many companies do not involve their inventors in the final development of the product and the marketing side of the business.” Frantz’s company obtains promising medical patents and, with the inventor acting as product champion, produces and markets these innovations. This example of a company taking advantage of corporate-research separation highlights the need for ongoing top management attention to the linkage problem.

We believe that marketing and R&D linkage is achievable, regardless of company size and complexity. Undoubtedly, top management’s direct input is necessary if either marketing or R&D is subordinate or totally removed from the other’s decision making. Top management must carefully orchestrate these first steps to ensure that the linkage has the appropriate priority. Once set, each marketing-R&D group will be concerned not only with market planning but also with offering directions for new research and applications. As we have emphasized, large multiple division companies need to develop systems that ensure consideration of all possible applications of new technology.

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